

Course Description Form

1. Course Name: Functional Analysis I					
2. Course Code: MATH501					
3. Semester / Year: First/MSc					
4. Description Preparation Date:2024/3/13					
5. Available Attendance Forms:					
6. Number of Credit Hours (Total) / Number of Units (Total):30hours/2					
7. Course administrator's name (mention all, if more than one name)					
Name: Dr. Ahlam J. Khaleel					
Email: ahlam.jamail@nahrainuniv.edu					
8. Course Objectives					
Course Objectives			1-Enable students to obtain knowledge and understanding some of the basic principles of Hilbert Spaces. 2-Empowering and raising the students skill to obtain knowledge and understanding of Algebra and linear continuous mappings.		
9. Teaching and Learning Strategies					
Strategy		<ul style="list-style-type: none"> Introductory written lectures and various activities and assignments which are given in the classroom. Answering the quick questions raised in the hall and the possibility of solving them by the student. Adopting the principle of preparing reports by students. 			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Pre-Hilbert Spaces with Some Properties	Pre-Hilbert Spaces	Attendance interactive lectures	Ask questions and give assignments
2	2	Some Fundamental Theorems in Pre-Hilbert Spaces	Pre-Hilbert Spaces	Attendance interactive lectures	Ask questions and give assignments
3	2	Some Examples of Metric Spaces	Metric Spaces	Attendance interactive lectures	Ask questions and give assignments
4	2	Incomplete Metric Spaces with some examples and Hilbert Spaces	Metric Spaces	Attendance interactive lectures	Ask questions and give assignments
5	2	Orthogonal Vectors, Orthonormal Vectors	Pre-Hilbert Spaces	Attendance interactive lectures	Ask questions, give assignments, and make a 1 st attendance mid exam
6	4	Infinite Sums in Hilbert Spaces	Hilbert Spaces	Attendance interactive lectures	Ask questions and give assignments
7	4	Total Sets, Separable Hilbert Space, Orthonormal Basis	Hilbert Spaces	Attendance interactive lectures	Ask questions and give assignments
8	4	Isomorphic Vector Space, Isomorphic Hilbert Spaces and Classical Hilbert Spaces	Vector Space	Attendance interactive lectures	Ask questions and give assignments
9	4	Annihilators, Closed Linear Subspaces	Pre-Hilbert Spaces	Attendance interactive lectures	Ask questions and give assignments
10	4	Complete Linear subspaces	Hilbert Spaces	Attendance interactive lectures	Ask questions and give assignments
11	4	Convex Sets and Minimizing Vector	Hilbert Spaces	Attendance interactive lectures	Ask questions and give assignments
12	4	Projection	Hilbert Spaces	Attendance interactive lectures	Ask questions, give assignments, and make a 2 nd attendance mid exam
13	4	Linear Mappings and Algebra	Vector Space	Attendance interactive lectures	Ask questions and give assignments
14	4	Continuous Mapping, Banach Algebra	Banach Space	Attendance interactive lectures	Ask questions and give assignments
15	4	Dual Space	Banach Space	Attendance interactive lectures	Ask questions and give assignments

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Introductory Functional Analysis with Applications by Erwin and Kreyszig.

Main references (sources)	Introduction to Hilbert Spaces by S.K. Berberian
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	